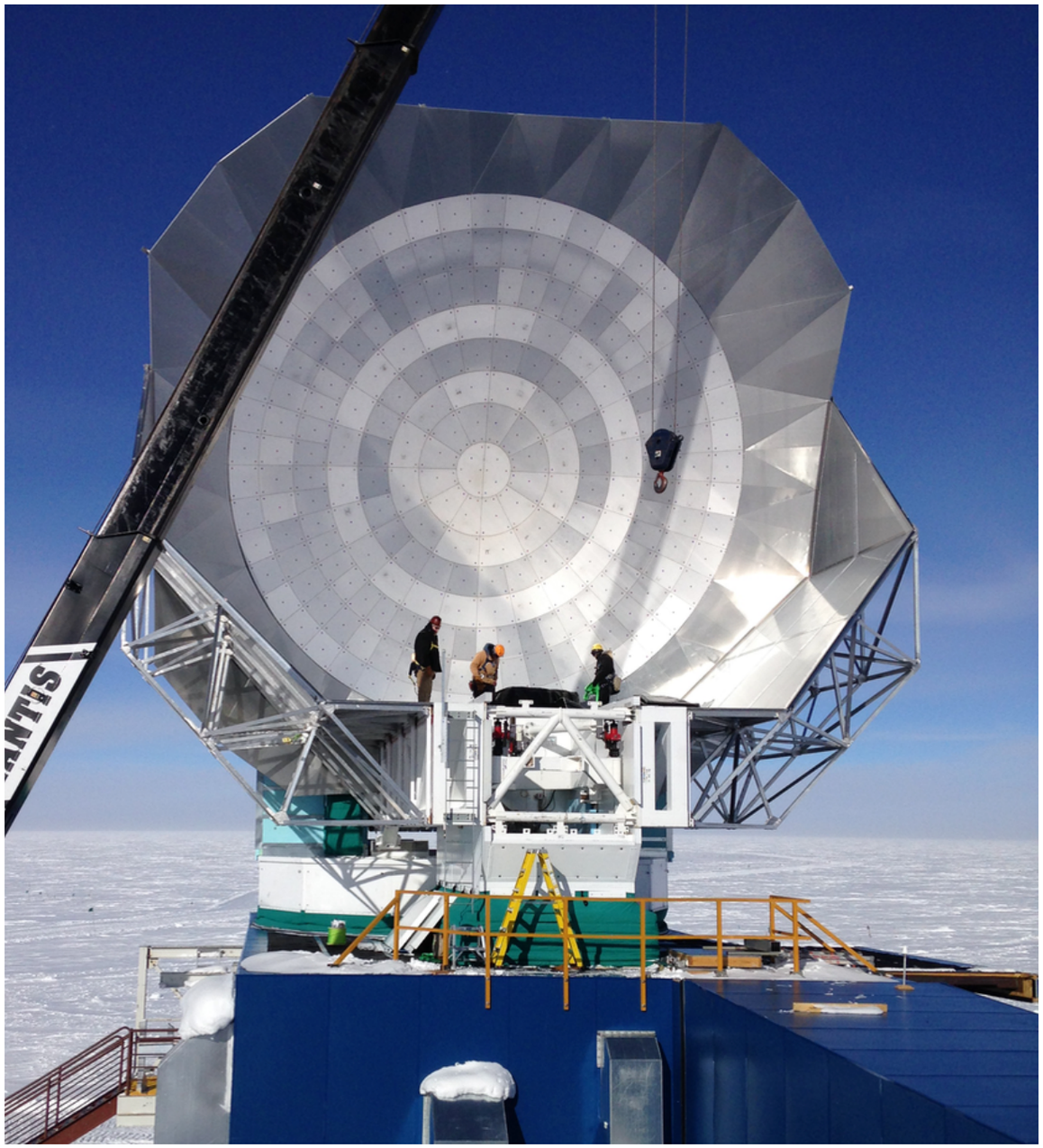
# *SPT-3G*

- South Pole Telescope (SPT) is a 10m telescope optimized for CMB polarimetry: ***inflationary B modes, neutrino mass, and more***
- Installed a new receiver and optics, called **SPT-3G**, with 10x more detectors (16,000) in January
- Engineering observations have been ongoing during 2017
- Will perform maintenance and further upgrades from November 2017 to January 2018



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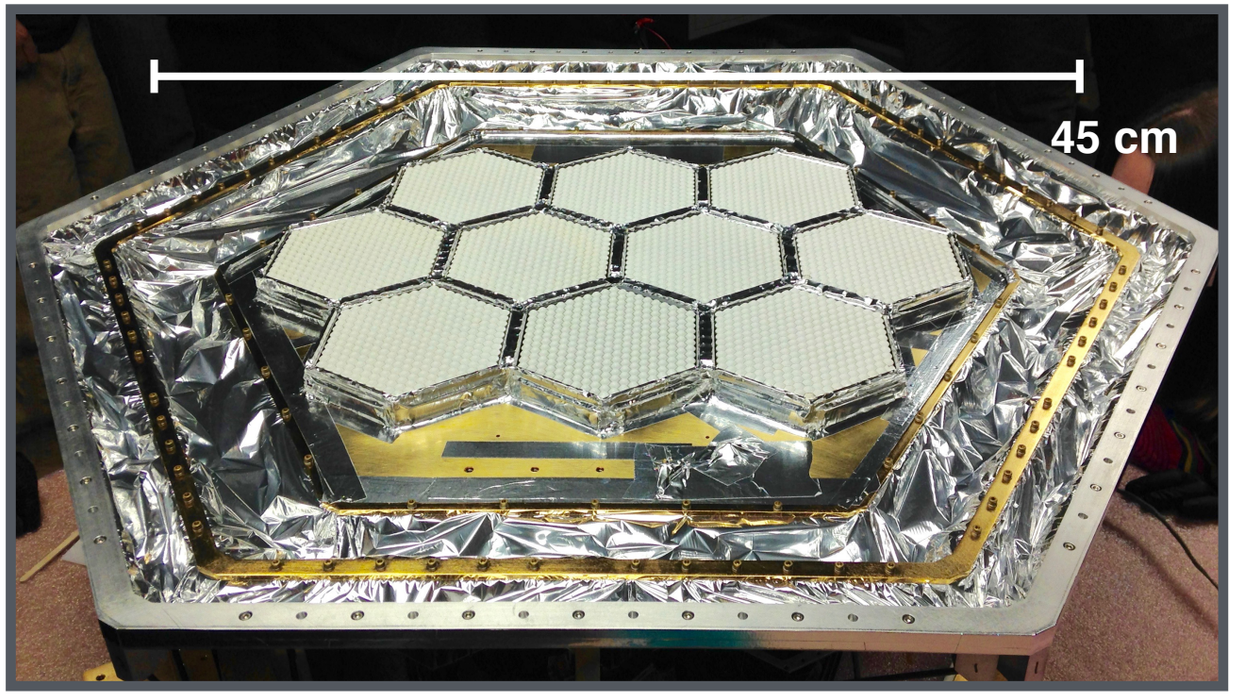
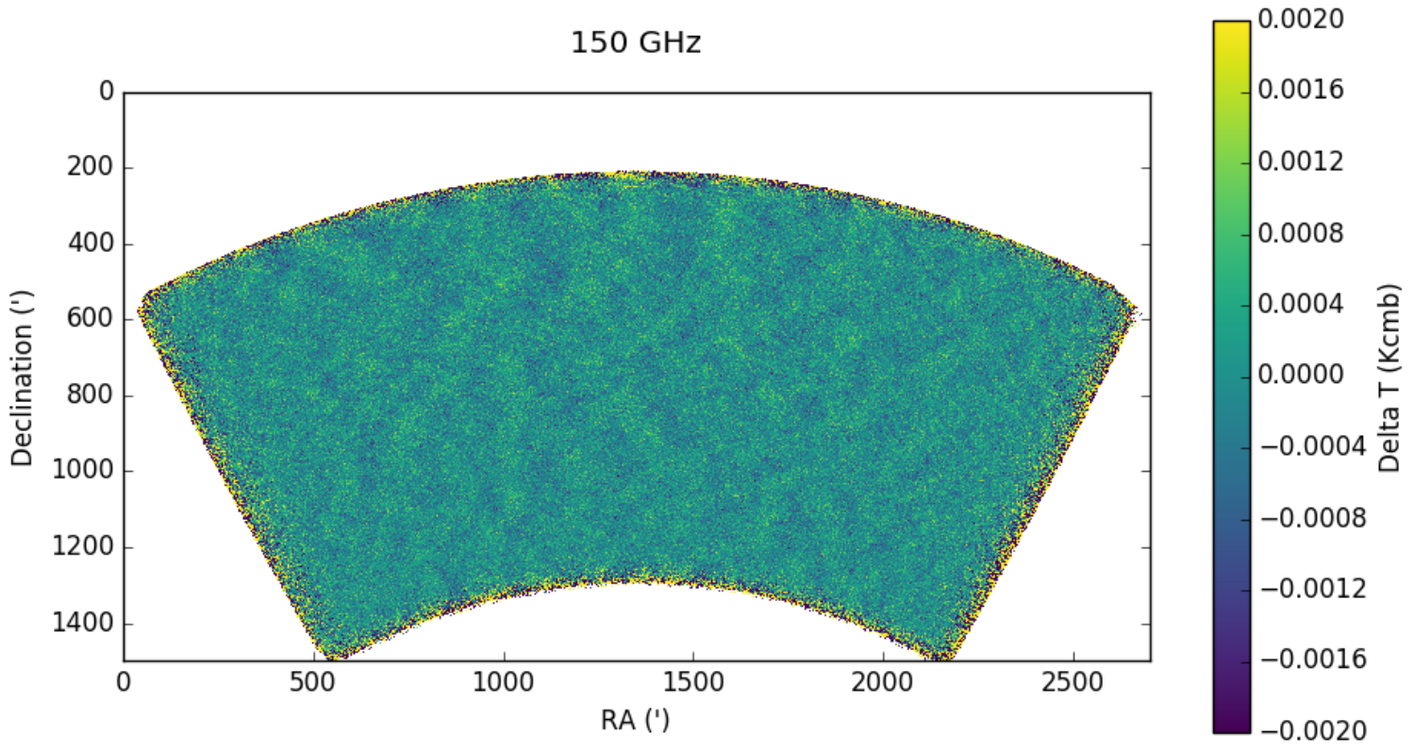
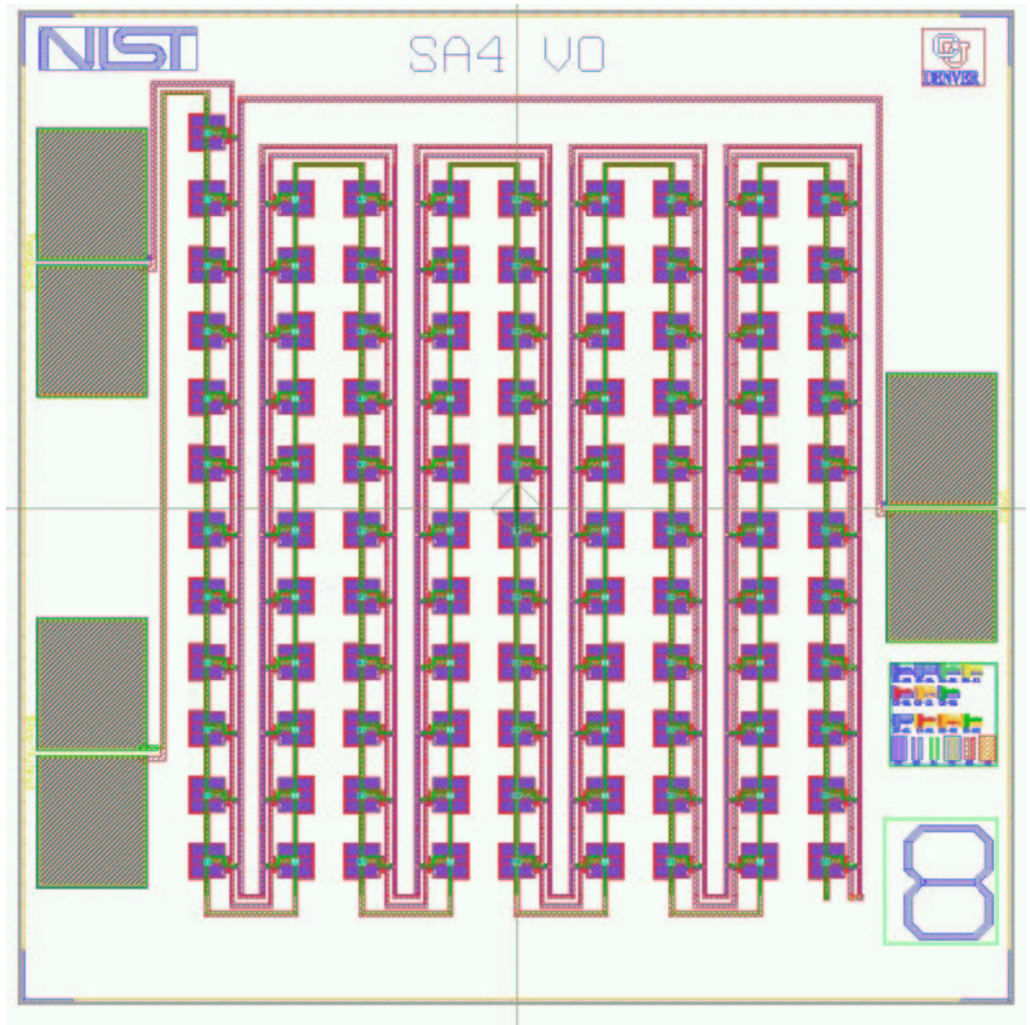


# *New SQUIDs*

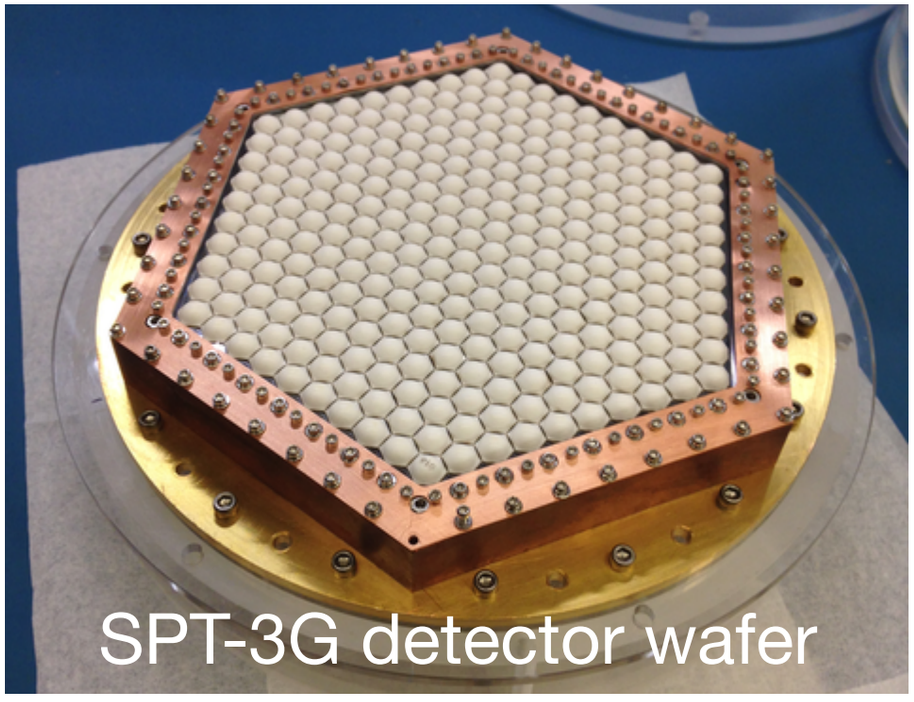
- Superconducting SQUID amplifiers in SPT-3G have excess noise due to high input impedance
- 320 new low-inductance SQUIDs fabricated by NIST, 240 needed
- At Fermilab now for assembly and wire bonding at SiDet **this week**, testing at University of Chicago
- Rapid R&D effort between NIST, Fermilab, Argonne, Berkeley, StarCryo




**Size = 4.5 mm x 4.5 mm**

# *New Detectors*

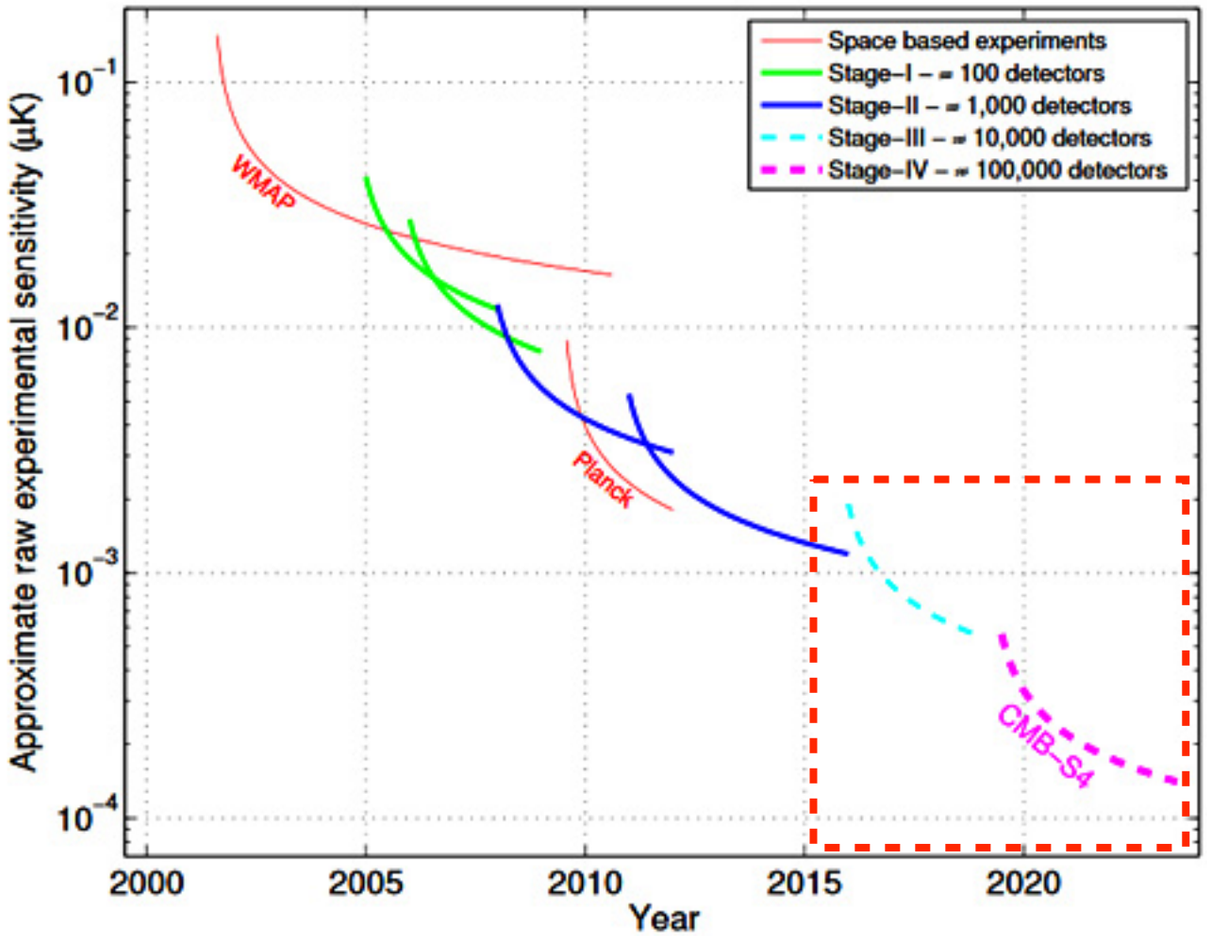
- 2017 detectors used intentionally conservative properties because of uncertainties about optical loading
- Replacing with new detectors fabricated by Argonne to meet more aggressive loading targets
- 10 of 10 wafers fabricated for deployment, wire-bonding/assembly ongoing at SiDet
- Argonne continuing to fabricate spare wafers, testing at Fermilab, Argonne, Toronto, Case, Chicago


SPT-3G detector wafer

testing cryostat at SiDet

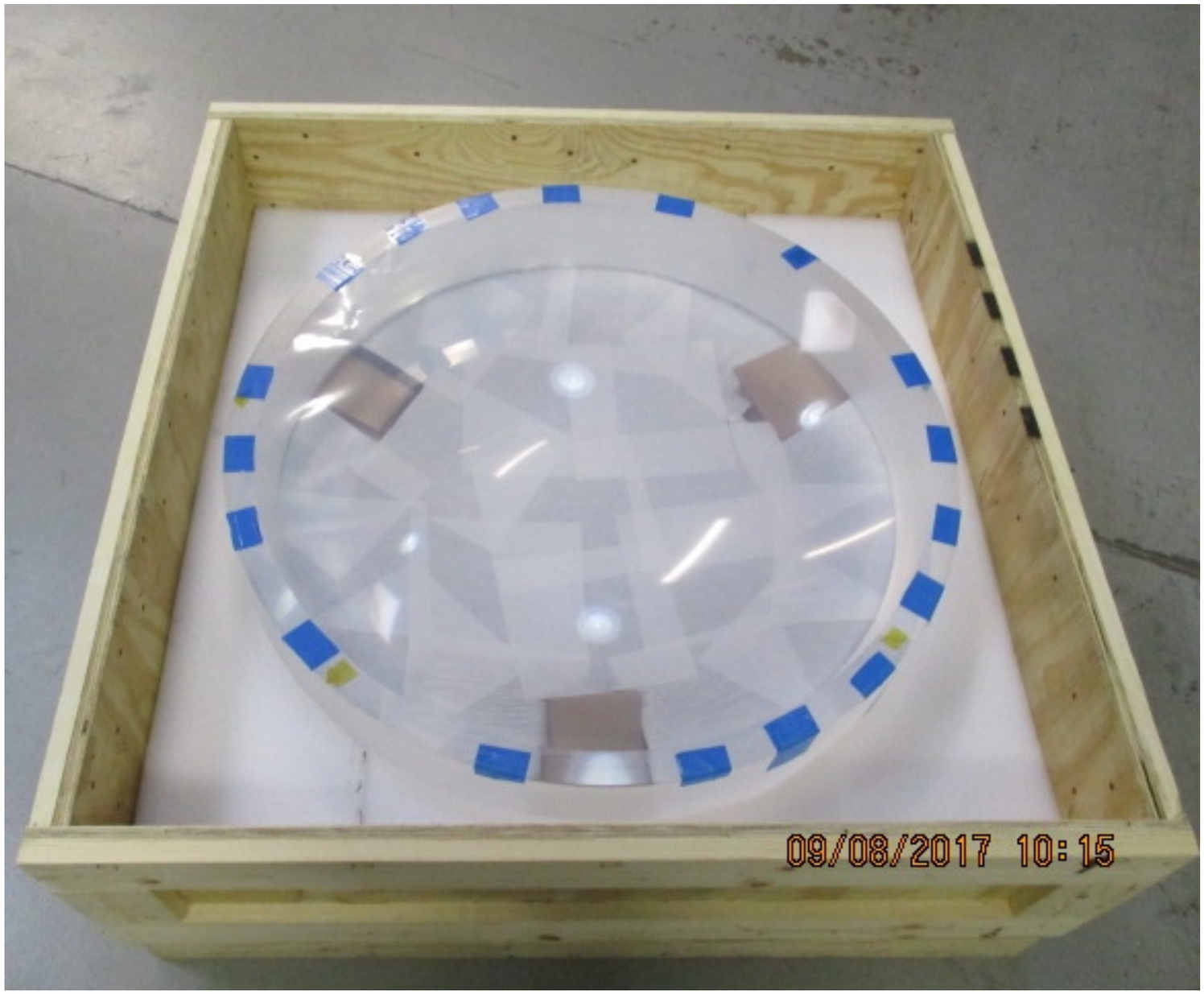
# *CMB-S4: Next-Generation Experiment*

- Planning underway for next-generation CMB-S4 experiment
- 500,000 detectors, multiple telescopes, sites in South Pole and Atacama
- Recent collaboration meeting at Harvard, completion of Concept Definition Team report, science and technology books
- R&D in early stages of coordination between labs, including Fermilab



# C2, the last lens packed for shipment!

- Awaiting final acceptance of final report from AOS



# Red channel and NIR channel CCD's finished

- Have >20 Red+NIR CCD's, 20 required.  Now making spares. Work done at SiDet led by Juan Estrada.